

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
PROJECT SPECIFICATIONS FOR THE INSTALLATION
OF AIR CONDITIONING EQUIPMENT AT THE HOUMA
AIRPORT TRAFFIC CONTROL TOWER (ATCT)
HOUMA, LOUISIANA

1. SUMMARY OF WORK

1.1 General - These specifications together with referenced specifications, cover the requirements of the Federal Aviation Administration (FAA) for furnishing all equipment, supplies, materials, tools, and their use in connection with the installation of air conditioning (AC) equipment at the Houma (HUM), LA ATCT site.

1 Scope

NOTE: Dimensions listed on the drawings and in this document are approximate and are provided for estimating purposes. It shall be the contractor's responsibility to verify all dimensions prior to ordering project materials or equipment.

1.1 The contractor shall remove the following:

A. Remove one (1) existing 8.5 ton package air conditioning (AC) unit. The package unit was manufactured by York and has model# DH102C00D2DTA3. The unit is installed ON TOP OF THE TOWER CAB ROOF which is approximately 70 feet above ground elevation. A crane will be required for AC removal. See project drawings for additional details.

B. The contractor shall also remove the package unit's return and supply air ductwork. The existing duct work is supported in part by the unit's steel support frame, the remaining ductwork support structure is composed of: 1.) Support pedestals 2.) Steel "L" channel, "C" channel and all thread bars. The contractor shall remove the steel "L" channel, "C" channel and all thread bars (the support pedestal shall remain for reuse).

C. The contractor shall also be required to remove the following electrical components: 1.) Existing liquid tight metallic flexible conduit in which power and control cable is installed. For estimating purposes the power cable is installed in 1-1/2" liquid tight conduit and the control/thermostat cable is installed in 3/4" liquid tight conduit. Conduit lengths are approximately 10 feet each.

The contractor shall remove the thermostat cable which is installed in the 3/4" conduit. The AC unit's power cable shall remain for reuse. The contractor shall remove all LBs and box connector conduit bodies associated with the flexible conduit.

D. The contractor shall remove the unit's condensate line.

Removal of additional items not identified in this section may be required, however, for estimating purposes the unidentified items (if any) should be small in quantity.

1.2 The contractor shall install the following components:

A. The contractor shall be required to purchase the following York AC unit: York package unit with model# **ZF102C00N2AAA**, the unit is a down flow model, 208 volt, three phase, 8.5 tons and has identical dimensions as the existing unit.

NOTE: A substitute package AC unit will not be accepted. Units other than York (as indented above) will significantly increase the cost of this project.

B. The contractor shall also install approximately 10 feet each ¾" metallic liquid tight conduit and 1-1/2" liquid tight metallic conduit. Approximately 60 feet of AC thermostat wire. The contractor shall replace all associated liquid tight conduit bodies.

C. The contractor shall also fabricate and install return and supply air duct work. The new duct work shall have the same dimensions as the existing ductwork. In addition to new duct work, the contractor shall install (on the existing duct support pedestal) the following items: 1.) Steel "L" channel, "C" channel and new stainless steel all thread bars.

D. The contractor shall install a new condensate line. The line shall be routed to an existing roof drain.

E. The contractor shall also remove an existing AC thermostat (which is installed in the tower cab). The contractor shall provide and install a new digital thermostat which will be installed in the same location as the existing unit.

C. The contractor shall also clean and paint the existing steel AC frame support structure

NOTE: The AC unit is located on the tower cab roof, which is about 70 feet above ground elevation. Removal of existing unit and reinstallation of the new unit may require an on-site-crane.

1.3 Temporary Air Conditioning (AC) Units

Because the ATCT must remain in operation while this work is underway, the contractor shall provide a temporary 10 ton AC unit and all duct work required for proper operation of temporary system. The portable temporary unit can be located on the ATCT catwalk which surrounds the tower cab and is below the cab roof.

2. Existing equipment removal criteria

2.1 The contractor shall be responsible for coordination of the work of various trades that may be involved in the job. Contractors are highly encouraged to conduct a site inspection prior to submitting a bid; to arrange for a site inspection, please contact Frank Landrum Manager, Mosiant SSC at (504) 471-4450 or (504) 352-5696.

2.2 Site Location - The HUM ATCT is located in Houma, LA and is on the North west side of the Houma Regional Airport.

2.3 Work Area - The work requires contractor activity within a critical FAA facility which must continue to operate while work is in progress. The contractor shall coordinate all aspects of the work with the FAA Resident Engineer (RE) prior to beginning each workday, to insure that equipment operation will not be affected.

2.4 Contractor Performance Time - Performance time is 5 work days.

2.5 Access to Worksite - The contractor shall be allowed to work 8 or 10 hour days. The FAA RE will provide for contractor access to the site and entry into the Tower. Parking for contractor vehicles will be as directed by the FAA RE.

2.6 Protection of Property - It is the contractor's responsibility to protect both government and private property from damage during the work process. All worksite areas and property that are damaged by the contractor or his employees during the work process shall be restored to their preconstruction condition by the contractor at no additional cost to the government.

2.7 Site Cleanup - The contractor, during the process of work, and upon completion of all work, shall remove from the worksite and properly dispose of all surplus materials, tools, equipment, etc., and shall clean up all rubbish and debris resulting from his work, to the satisfaction of the FAA RE.

2.8 Disposal of Old Air Conditioning Equipment - All old A/C equipment, ductwork, electrical equipment, conduits, wire, refrigerant and condensate lines shall be removed by the contractor from the Houma ATCT site.

3. MATERIALS AND EQUIPMENT

Any deviation from the listed specifications must be approved in writing by the FAA RE. All equipment will be delivered in original unopened containers or factory shipping crates to the job site location.

NOTE: Prior to purchasing any materials or equipment and fabricating duct work, the contractor must submit, for approval shop drawings, manufacture data sheets and technical publications on AC units, dampers, firestats and other control components.

3.1 Air Conditioning Equipment - The contractor shall furnish and install a package unit equipped with a factory sealed refrigeration system completely factory assembled, wired, charged and tested, and as a minimum shall include return air-air filters, access filter frame, refrigerant piping, refrigerant service valves, stainless steel drain pan, insulated cabinet, ac power outlets, time delay relays and all associated controls and wiring.

4 INSULATION MATERIALS

A. Products shall not contain asbestos, lead, mercury, or mercury compounds.

B. Mineral-Fiber Board Insulation: Mineral or glass fibers bonded with a thermosetting resin; for duct and plenum applications, provide insulation without factory-applied jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products:

a. CertainTeed Corp.; CertaPro Commercial Board, or approved equal.

4.1 INSULATING CEMENTS

A. Mineral-Fiber Insulating Cement, must be compatible with insulation board.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Insulco, Division of MFS, Inc.; Triple I.

b. P. K. Insulation Mfg. Co., Inc.; Super-Stik.

4.2 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

4.4 SEALANTS

A. Joint Sealants:

Materials shall be compatible with insulation materials, jackets, and substrates.

Color: White or gray.

B. ASJ Flashing Sealants:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-76.

2. Materials shall be compatible with insulation materials, jackets, and substrates.

4.6 SECUREMENTS (Not all listed will apply to this project)

A. Insulation Pins and Hangers:

1. Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, **0.106-inch-** diameter shank, length to suit depth of insulation indicated.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) AGM Industries, Inc.; CWP-1.

2) GEMCO; CD.

3) Midwest Fasteners, Inc.; CD.

4) Nelson Stud Welding; TPA, TPC, and TPS.

2. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, **0.106-inch-** diameter shank, length to suit depth of insulation indicated with integral **1-1/2-inch** galvanized carbon-steel washer.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) AGM Industries, Inc.; CWP-1.

2) GEMCO; Cupped Head Weld Pin.

3) Midwest Fasteners, Inc.; Cupped Head.

4) Nelson Stud Welding; CHP.

3. Metal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) AGM Industries, Inc.; Tactoo Insul-Hangers, Series T.

2) GEMCO; Perforated Base.

3) Midwest Fasteners, Inc.; Spindle.

b. Baseplate: Perforated, galvanized carbon-steel sheet, **0.030 inch** thick by **2 inches** square.

c. Spindle: Copper- or zinc-coated, fully annealed, **0.106-inch-** diameter shank, length to suit depth of insulation indicated.

4.8 CORNER ANGLES (if required)

A. Aluminum Corner Angles: **0.040 inch** thick, minimum **1 by 1 inch** , aluminum according to **ASTM B 209** , Alloy 3003, 3005, 3105 or 5005; Temper H-14.

4.9 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application. Verify that systems and equipment to be insulated have been tested and are free of defects. Verify that surfaces to be insulated are clean and dry. Proceed with installation only after unsatisfactory conditions have been corrected.

4.10 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
 B. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.
 C. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

4.11 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment, ducts and fittings, and piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment, duct system, and pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic. Install insulation continuously through hangers and around anchor attachments. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

4.14 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation: Outdoor, exposed supply and return.

4.15 ABOVEGROUND, OUTDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. Insulation materials and thicknesses are identified below. If more than one material is listed for a duct system, selection from materials listed is Contractor's option.

B. Exposed, rectangular, supply-air duct insulation shall be the following:

1. Mineral-Fiber Board: 2 inches thick and 3-lb/cu. ft. nominal density.

C. Exposed, rectangular, return-air duct insulation shall be the following:

1. Mineral-Fiber Board: 2 inches thick and 3-lb/cu. ft. nominal density.

4.16 Metal Ducts

2.1 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

4.17 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections. B. Galvanized Sheet Steel:

Galvanized Coating Designation: G60.

Finishes for Surfaces Exposed to View: Mill phosphatized.

PART 3 - EXECUTION

4.19 INSTALLATION OF EXPOSED DUCTWORK

- A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.
- B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.
- C. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.
- D. Repair or replace damaged sections and finished work that does not comply with these requirements.

4.20 DUCT SEALING

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

4.21.2 DUCT SCHEDULE

- A. Fabricate ducts with galvanized sheet : B. Supply Ducts: 1. Ducts Connected to Constant-Volume Air-Handling Units:

- a. Pressure Class: Positive 2-inch wg.
- b. Minimum SMACNA Seal Class: A.

C. Return Ducts:

- 1. Ducts Connected to Air-Handling Units:
 - a. Pressure Class: Positive or negative 2-inch wg.
 - b. Minimum SMACNA Seal Class: A.

D. Elbow Configuration (if applicable):

- 1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
 - a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
 - b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
 - c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible,"

4.22.1 MANUAL VOLUME DAMPERS (if applicable)

A. Standard, Steel, Manual Volume Dampers:

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Air Balance Inc.; a division of Mestek, Inc.
 - b. American Warming and Ventilating; a division of Mestek, Inc.
 - c. Flexmaster U.S.A., Inc.
 - d. McGill AirFlow LLC.
 - e. Nailor Industries Inc.
 - f. Pottorff.
 - g. Ruskin Company.
 - h. Trox USA Inc.
 - i. Vent Products Company, Inc.
- 2. Standard leakage rating, with linkage outside airstream.
- 3. Suitable for horizontal or vertical applications.
- 4. Frames:
 - a. Frame: Hat-shaped, 0.094-inch- thick, galvanized sheet steel.

- b. Mitered and welded corners.
- 5. Blades:
 - a. Multiple or single blade.
 - b. Parallel- or opposed-blade design.
 - c. Stiffen damper blades for stability.
 - d. Galvanized-steel, 0.064 inch thick.
- 6. Blade Axles: Galvanized steel
- 7. Bearings:

a. Molded synthetic.

b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.

B. Damper Hardware: Zinc-plated, die-cast core with dial and handle made of 3/32-inch- thick zinc-plated steel, and a 3/4-inch hexagon locking nut. Include center hole to suit damper operating-rod size. Include elevated platform for insulated duct mounting.

4.22.2 TURNING VANES (if applicable)

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ductmate Industries, Inc. 2. Duro Dyne Inc. 3. Elgen Manufacturing. 4. METALAIRE, Inc. 5. SEMCO Incorporated.

2. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.

C. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows." D. Vane Construction: Single wall.

4.22.3 DUCT ACCESS PANEL ASSEMBLIES (if applicable)

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Labeled according to UL 1978 by an NRTL.

C. Panel and Frame: Minimum thickness 0.0528-inch carbon steel.

D. Fasteners: Carbon steel. Panel fasteners shall not penetrate duct wall.

E. Gasket: Comply with NFPA 96; grease-tight, high-temperature ceramic fiber, rated for minimum 2000 deg F .

F. Minimum Pressure Rating: 10-inch wg , positive or negative.

3.1 INSTALLATION

A. Install duct accessories (if applicable, in that new ductwork shall match existing ductwork) according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts.

B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts. C. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger

ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.

D. Set dampers to fully open position before testing, adjusting, and balancing.

NOTE: All control wiring shall be done in accordance with manufacturer's specifications.

4.24 Electrical Requirements - Electrical hookup to the units shall be done in accordance with the most recent version of the National Electric Code

5.) Electrical **4 Electrical Work (where applicable)**

4.2 General

4.2.1 Ground Requirements

4.2.2 General - All equipment ground conductors shall be green color coded, grounding electrode conductor shall be bare, and sized as specified or indicated, and if not specified or indicated, it shall be in accordance with Article 250 of the National Electrical Code. Grounding lugs, connectors and other components shall comply with the National Electrical Code.

All neutral conductors shall extend from the neutral bus in the device where the active conductors originate. Device terminals for connection of more than one conductor shall be specifically designed for that purpose.

4.2.3 Conductors

4.2.3.1 Un-insulated Conductors - Un-insulated conductors shall be copper.

4.2.3.2 Insulated Conductors - Unless otherwise indicated, insulated conductors shall be copper with thermoplastic or thermosetting insulation, type THWN, and XHHW for general use, or type THHN for use in dry locations only, all insulated for 600V in accordance with Federal Specification J-C-30. Conductors #10 AWG and smaller shall be solid, and conductors #8 AWG and larger shall be stranded. Minimum branch circuit conductor size shall be #12 AWG. Minimum control wire size shall be #14 AWG Stranded, unless noted otherwise.

4.2.3.3 Color Coding - All branch circuit and feeder conductors shall be color coded as specified hereinafter. The color coding shall be continuous throughout the facility on each phase conductor to its point of utilization so that the conductor phase connection is readily identifiable in any part of the installation. The equipment grounding conductor shall be covered with green insulation or shall be bare copper as specified hereinbefore. Where color coding is not available in the larger size conductors, the conductors shall be color coded by use of color coded tape, half lapped for a minimum length of 3 inches. Where conductors are color coded in this manner, they shall be color coded in all junction and pull boxes, accessible raceways, panel boards outlets, and switches, as well as at all terminations. Conductors in accessible raceways shall be coded in such a manner that by removing or opening any cover, the coding will be visible. Phase rotation in the 3 Phase system shall match that which was delivered by the old facility E/G and power company.

Phase conductors shall be color coded as follows:

Single Phase	Three Phase
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120/240 Volts	120/208 or 240 volts
Line A - Black	Phase A - Black
Line B - Red	Phase B - Red
Neutral - White	Phase C - Blue
Ground - Green	Neutral - White
	Ground - Green

4.2.3.4 Splices and Terminations - There should be no cable splicing associated with this project.

4.2.3.5 Connectors, Power Cable - Connections of cable conductors shall be made using crimp connectors utilizing a crimping tool designed to make a complete crimp before the tool can be removed.

4.2.3.6 Appearance - Neatly and securely bundle and tie all conductors in an enclosure using nylon straps with a locking hub or head on one end and a taper on the other.

4.3 Raceways

4.3.1 Raceway System - Minimum conduit size shall be 3/4-inch, but may be 1/2 inch for exposed control wiring. Each run shall be complete, and shall be fished and swabbed before conductors are installed. Ends of conduit systems not terminated in boxes or cabinets shall be capped. Crushed or deformed raceways shall not be installed. Sections of raceways which pass through to damp, concealed or underground locations shall be of a type approved for such locations by the FAA COR, and shall extend a minimum of 12 inches beyond the damp, concealed, or underground area.

Boxes - Boxes shall be either the cast metal hub type, or shall be one piece galvanized steel type. Where not sized on the drawings, boxes shall be sized in accordance with the NEC. Boxes shall be provided in the wiring or raceway system for pulling wires, making connections, and mounting devices or fixtures. Boxes for metallic raceways shall be of the cast-metal threaded hub type in wet locations, or surface mounted on outside of exterior surfaces. Each box shall have the volume required by the National Electrical Code for the number of conductors in the box. Each outlet box shall have a machine screw which fits into a tapped hole in the box for the ground connection. Cast-metal boxes installed in wet locations and boxes installed flush with the outside of exterior surfaces shall be gasketed. Boxes shall not be supported from sheet metal roof decks.

4.4 Painting and Finishing - Where factory finishes are provided on equipment and no additional field painting is specified, all marred or damaged surfaces shall be touched up or refinished so as to leave a smooth, uniform finish at the time of final inspection as directed by the COR.

4.5 Repair of Existing Work - Electrical work shall be carefully laid out in advance. Where cutting, channeling, chasing, or drilling of floors, wall partitions, ceilings, or other surfaces is necessary for the proper installation, support, or anchorage of the conduit, raceways, or other electrical work, it shall be carefully done. Asbestos - containing material (ACM) shall not be disturbed unless proper procedures are used. Damage to the building, piping, or equipment shall be repaired by skilled mechanics of the trades involved at no additional cost to the Government.

4.7 General - The rules, regulations, and reference specifications noted shall be considered as minimum requirements. They shall not relieve the contractor from

furnishing and installing higher grades of material and workmanship than are specified or then so required by the specification drawings.

4.8 Materials - Materials furnished by the contractor under this specification shall be new and the standard product of the manufacturer's latest designs that comply with the specification requirements. Wherever standards have been established by the Underwriters Laboratories, Inc., the materials shall bear the UL label.

5. METAL FRAME REFURBISHMENT

5.1 Prior to painting the existing metal AC unit's frame; the contractor shall prepare the metal surface to receive paint.

5.2 Surface prep. will involve removing all loose rust, mill scale, grease, oil residue, and dirt from metal frame.

5.3 After surface prep is complete, the contractor shall use the following painting schedule:

1. 1st coat- Apply a rust converter over entire metal surface. The contractor can use a converter as manufactured by Eastwood or approved equal. Next use Alkyd System: MPI EXT 5.1D.

- a.** Prime coat: Exterior alkyd enamel
- b.)** Top coat: Exterior alkyd enamel (semigloss)

6. SYSTEM START-UP

6.1 Electrical Checks - Prior to energizing high- or low-voltage circuits to the system, the contractor shall inspect all factory and field installed wiring for loose or improper connections. Any improperly installed wiring shall be corrected to the satisfaction of the FAA COR. The contractor shall check voltage supply at disconnect switches or fuses to determine if voltage is within range listed on the manufacturer's data sheets. The Contractor shall Notify the FAA COR if voltage is outside of manufacturer's specifications.

5.2 Energizing System - The contractor shall energize the high- and low-voltage circuits on the units in the presence of the FAA COR. The contractor shall verify, in the presence of the FAA COR, that the voltage and amperage draw of the condensing and evaporator sections are within ranges listed on the manufacturer's data sheets. If voltage or current is out of tolerance, the condition shall be corrected to the satisfaction of the FAA COR. The contractor shall verify that all functions of each unit operate properly. Any function that does not operate properly shall be corrected to the satisfaction of the FAA COR.

5.3 Vibration Checks - The contractor shall check condenser and evaporator fans and units as a whole while running to determine if abnormal vibrations are occurring. Any abnormal vibration shall be corrected to the satisfaction of the FAA COR.

5.4 Refrigerant Charge - Contractor shall check refrigerant charge of units using refrigerant manifold-gauge set. System charge shall be in accordance with manufacturer's recommendations.

6. FINAL INSPECTION

6.1 System Operation - The contractor shall demonstrate to the FAA COR that all functions of system are operating properly and in accordance with manufacturer's recommendations for heating and cooling mode.

6.2 Air Filters - The contractor shall demonstrate to the FAA COR the method for installing and removing the air filters from the unit.

6.3 System Operating Instruction Manual - The contractor shall provide the FAA COR a copy of the operating instruction manual and warranty cards for all major system components at the time of final inspection.

6.4 System Warranty - In addition to parts only warranty offered by unit manufacture. The contractor shall provide a 5-year parts and labor warranty (including refrigerant) for the AC units. In addition to unit warranty, the contractor shall warrant all AC roof penetration work against leaks for a period of one year.